

**REMARKS**

The Applicants have carefully considered this application in connection with the Examiner's Action and respectfully request reconsideration of this application in view of the foregoing amendment and the following remarks.

The Applicants originally submitted Claims 1-23 in the application, and in prior responses, cancelled claims 1-17 and 23 and added new claim 24. In the present response, the Applicants have amended Claims 18-22 and 24, and added new claims 25-27. Accordingly, Claims 18-22 and 24-27 are currently pending in the application.

The amendments to the claims and new claims are fully supported by the specification. For example, Figs. 5 and Page 10 Lines 2-15 in the pending application describe collapsing a sintered overladding tube onto to the core and cladding to form the final preform. Hence, the preform comprises a sintered overladding layer. For example, Page 10, Lines 23 to 20 of the application discloses ID variations along the overladding tube of below 1 percent. For example, Page 11, Line 2-6 discusses the maximum OD minus minimum OD differences of 30 microns at one location along the overladding tube, and percent variations of the OD of  $10^{-1}$  or less at any longitudinal position along the preform.

**I. Rejection of Claims 18-22 and 24 under 35 U.S.C. §103**

The Examiner has rejected Claims 18-22 and 24 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,609,666 to Heitmann ("Heitmann") in view of U.S. Patent No. 5,221,306 to Fleming *et al.* ("Fleming") and U.S. Patent No. 4,367,085 to Suto *et al.* ("Suto") and optionally in view of U.S. Patent No. 5,917,109 No. to Berkey ("Berkey"). In addition, the Examiner

has, for the first time, rejected Claims 18-22 and 24 under 35 U.S.C. §103(a) as being unpatentable over Berkey alone or in view of U.S. Patent No. 5,314,517 to Koenig *et al.* ("Koenig"), U.S. Patent No. 5,314,517 to Imoto *et al.* ("Imoto") and U.S. Patent No. 4,597,785 to Karbassiyoon ("Karbassiyoon").

The Applicants submit that the foregoing combinations of references fail to establish a *prima facie* case of obviousness with respect to independent claims 18 and 25 and their respective dependent claims.

Concerning the rejection based on Heitmann in view of Fleming, Suto, and optionally in view of Berkey, the Examiner is on the record of stating that neither Heitmann, Fleming nor Berkey teach or suggest the element of an inner diameter of an overladding layer that varies by less than 1 percent. For this element, as per the Office Action of 10/15/2004, the Examiner relies on the teaching or suggestions of Suto, and specifically cites two sections of Suto: Column 1, Lines 32-46 and Column 9, Lines 33-38, to support his rejection.

Similiar to that pointed out in the response mailed January 24, 2005, the Office Action cites portions from Suto does not teach an "an inner diameter of the sintered overladding layer varies by less than 1 percent over the length of the preform" as recited in amended claim 18.

In particular, neither of the above-cited portions of Suto, even describe an overladding layer.

For example, Suto states:

Because of this disadvantage of the conventional VAD method, it has been very difficult to improve transmission bandwidth properties of multi-mode optical fiber ... and to improve transmission loss properties by the simultaneous formation of core and cladding regions.

Suto, col. 1, lines 35-43 (underlining added).

The above-cited portion of Suto describes a VAD method for making a preform having both a core and a cladding layer, but not an overladding layer. Thus, at col. 1, lines 32-46, Suto does not teach the limitation on an inner diameter of the overcladding layer as recited in amended claim 18.

Similarly, at cited col. 9, lines 26-38, Suto describes the fabrication of a porous preform 11, and Suto's Figure 6 illustrates that preform 11 is used to form a consolidated preform 14. Nevertheless, neither perform 11 or 14 has an overladding layer, because Suto's Figure 12 illustrates a process for adding a silica jacket 50 to preform 14. Indeed, such a silica jacket may generally have a different composition than the preform 14 and be an overladding layer. Examples of similar silica overladding layers are, e.g., described in U.S. Patent 6,550,280, col. 1, lines 21-26, which issued from application no. 09/459,775, which is incorporated into the pending application. Thus, at col. 9, lines 26-38, Suto's teachings about the diameter of the preform 11 are not relevant to diameters of overladding layers, because the preform 11 does not yet have an overladding layer.

Furthermore, Suto's teachings on effects of core/cladding layers on the optical properties of the final optical fiber would not have suggested that the overladding layers produce similar effects, because about 99% of the light typically propagates in the cladding/core layers of the optical fiber. In contrast, the overladding layer largely determines the mechanical properties of the final optical fiber. See pending specification, page 1, last paragraph.

It follows therefore, that the combination of Heitmann, in view of Fleming, Suto and optionally in view of Berkey fail to teach or suggest that an inner diameter of a sintered overladding layer varies by less than 1 percent over the length of the preform, as recited in Claim 18.

Concerning the Examiner's new rejection based on Berkley alone or in view of Koenig, Imoto and Karbassiyoono, the Examiner is on the record as stating that Berkey does not teach an overladding layer having an inner diameter that varies by less than 1%. Therefore the rejection of Claims 18-22 and 24 based on Berkey alone seems to be without foundation.

The Examiner cites Koenig, Imoto and Karbassiyoono for the proposition of suggesting that, "it is well known that non-uniformities create problems in the final fiber" (Examiner's Final Rejection mailed 04/26/2005; page 3, last two lines). The Applicants contend that none of these references in combination with Berkey teach or suggest the element of an inner diameter of a sintered overladding layer that varies by less than 1 percent over the length of the preform, as recited in Claim 18.

In the Office Action, the citations to col.1 lines 14-16 of Imoto, col.1 lines 26-34 of Koenig and col.1 lines 43-69 of Karbassiyoono do not teach the above-described element as recited by claim 18, because the cited text do not discuss the variation in the inner diameter of a sintered overladding layer over the length of the preform. The cited text of Imoto discusses the uniformity in the fiber diameter. The cited text of Koenig discusses variations in the diameter of drawn cane. The cited text of Karbassiyoono discusses difference in the cladding/core ratio of the fibers drawn from such optical preforms. Therefore it is not apparent why the cited text of these references in combination with Berkey would teach or suggest an inner diameter of a sintered overladding layer that varies by less than 1 percent over the length of the preform, as asserted by the Examiner.

Based on these considerations, the Applicants respectfully submit that the combination of Heitmann, in view of Fleming, Suto and optionally in view of Berkey, or Berkey alone, or Berkey in

view of Koenig, Imoto and Karbassiyoono do not teach or suggest all the elements of the inventions claimed in claim 18 or its dependent claims.

The Applicants further note that new Claim 25 bears a relationship to the original language of Claim 18, which the Examiner rejected in his first office action mailed 10/15/2004. The Examiner's obviousness rejection was based on the combination of Heitmann in view of Fleming and optionally in view of Berkey. For the reasons explained below, the Applicants maintain that this combination of references fails to establish a *prima facie* case of obviousness of new Claim 25 and its dependent claims.

The Examiner stated in his office action mailed 10/15/2004 that Heitmann does not teach the outer diameter variation recited in former Claim 18. For this element, the Examiner turns to Fleming. In particular, the Examiner refers to the distances shown in Fig. 6 as evidence for teaching an outer diameter variation of about 0.01 mm, which the Examiner estimates to be less than a 0.1% variation.

As part of the Examiner's analysis (page 5 office action mailed 10/15/2004) it appears that the Examiner has assumed that the outer diameter at one longitudinal position along one of the preform samples in Fig. 6 is equal to the distance (d) at a 0 degree angular interval plus the distance at a 180 degree interval. The Examiner then compared this to the sum of distances at 20 and 200 degree intervals.

The Applicants wish to point out that this calculation is erroneous because the sum of distances at 0 and 180 degree, or 20 and 200 degree intervals do not equal the outer diameter of Fleming's preform. This is made clear by Fleming's Fig. 1 and associated text, which defines distances  $d_1 \dots d_n$  as corresponding to distance from the preform periphery to the core periphery

(Column 2, Lines 4-5). Fleming repeats this definition for the example data presented in Figs. 5 and 6 (Column 5, lines 38-39). However, the sum of distances at intervals that are 180 degrees apart cannot equal the outer diameter of the preform because this sum does not include the diameter of the core. In fact Fig. 6 says nothing about the diameter of the core, or extent of uniformity or non-uniformity of the core diameter. It follows, therefore, that the Fleming's Fig. 6 cannot be used as grounds for teaching or suggesting an outer diameter variation of 0.1 percent or less along the length of the preform, as recited in new Claim 25.

Therefore, the Applicants respectfully submit that the combination of Heitmann in view of Fleming and optionally in view of Berkey do not teach or suggest all the elements of the inventions claimed in new claim 25 or its dependent claims.

In view of the foregoing remarks, the cited references do not support the rejection of Claims 18-22 and 24 under 35 U.S.C. §103(a). The Applicants therefore respectfully request the Examiner to withdraw these rejections.

## **II. Conclusion**

In view of the foregoing amendment and remarks, the Applicants now see all of the Claims currently pending in this application to be in condition for allowance and therefore earnestly solicit a timely Notice of Allowance for Claims 18-22 and 24-27.

The Applicants request the Examiner to telephone the undersigned attorney of record at (972) 480-8800 if such would further or expedite the prosecution of the present application.

Respectfully submitted,

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